Guide to Significant Changes Made to the May 2002 Draft Based on the Second Round of Review Comments and the Independent Scientific Peer Review

Foreword

Significant text edits

Executive Summary

Significant text edits with new tables and figures added

Notices

Significant text edits

Acknowledgments

Minor additions

I. Introduction

Minor text edits

II. Chesapeake Bay Nutrient and Sediment Enrichment Criteria

Minor text edits

III. Dissolved Oxygen Criteria

BACKGROUND

• Text completely re-written

Natural dissolved oxygen processes

Significant text edits

Chesapeake Bay oxygen dynamics

Significant text edits with new text add

Low dissolved oxygen: historical and recent past

• Entire section completely revised with new text and extensive new references

APPROACH

Significant text edits

Chesapeake Bay science

Minor text edits

Chesapeake Bay dissolved oxygen restoration goal framework

Minor text edits

Regionalizing the EPA Virginian Province saltwater dissolved oxygen criteria

- Significant text edits
- New section describing the larval recruitment effects model added

• Extensive new section addressing temperature/dissolved oxygen effects findings added

Application of the EPA freshwater dissolved oxygen criteria

New text added to early life stages section

Species listed as endangered/threatened

 New text providing more definitive findings regarding historical and potential sturgeon tidal habitats added

Scientific literature findings

Minor text edits

Instantaneous minimum versus daily mean

• Significant text edits

Recognized strengths and limitations

- Significant text edits including text moved to other sections (Regional Species Effects)
- New section on pH/dissolved oxygen interactions added

CHESAPEAKE BAY DISSOLVED OXYGEN CRITERIA DERIVATION

• Significant text edits

Migratory fish spawning and nursery designated use criteria

- Minor text edits
- Significant enhancements made to existing figures

Open-water fish and shellfish designated use criteria

- Minor text edits
- New 5.5 mg liter-1 30 day mean criterion value added to protect tidal fresh open water habitats

Deep-water seasonal fish and shellfish designated use criteria

- Significant text edits
- Significant enhancements made to existing figures

Deep-channel seasonal refuge designated use criteria

- Significant new text addressing rationale for the deep channel criteria
- Table listing effects data expanded

Chesapeake Bay Dissolved Oxygen Criteria

Table summarizing the Bay dissolved oxygen criteria reformatted and updated

LITERATURE CITED

• Full citations added for all literature referenced in the chapter text, tables and figures

IV. Water Clarity Criteria

BACKGROUND

Minor edits.

APPROACH

Minor edits.

Relationships of water quality, light and SAV

Minor edits.

Light requirement determination

Minor edits with some text additions.

Recognized strengths and limitations

 Significant edits and additions of new text addressing plant morphology, light requirements for new bay grass beds, color, validation of predicted vs. actual bay grass distribution and light availability studies

WATER CLARITY CRITERIA DERIVATION

Minimum light requirements

• Minor edits.

Light through water requirements

• Minor edits.

Light at the leaf requirements

• Minor edits.

CHESAPEAKE BAY WATER CLARITY CRITERIA

• Minor edits but significant text additions; addition of new table translating the percent light criteria into Secchi depth equivalents.

LITERATURE CITED

• Full citations for all literature cited in the text, tables and figures.

V. Chlorophyll a Criteria

BACKGROUND

• Significant text edits

APPROACH TO DERIVING CHLOROPHYLL A CRITERIA

Significant text edits

Chlorophyll a concentrations characteristic of desired ecological conditions

Completely new section

Protecting against water quality impairments

Completely new section

Strengths and limitations of the criteria derivation procedures

- Significant text edits
- Several new subsections of text added

CHESAPEAKE BAY CHLOROPHYLL A CRITERIA DERIVATION

• Significant text edits

Narrative chlorophyll a criteria

Completely new section

Chlorophyll a concentrations characteristic of desired ecological conditions

Completely new section

Chlorophyll a concentrations protective against water quality impairments

• Significantly revised text, revised/new figures and tables

CHESAPEAKE BAY CHLOROPHYLL A CRITERIA

Significant text edits

Narrative chlorophyll a criteria

Completely new section

Numerical chlorophyll a criteria

Completely new section

Methodologies for deriving waterbody-specific chlorophyll a criteria

Completely new section

LITERATURE CITED

• Revised to reflect significant changes in chapter text references

VI. RECOMMENDED IMPLEMENTATION PROCEDURES

DEFINING CRITERIA ATTAINMENT

• Minor text edits

Dissolved oxygen criteria

• Minor text edits; revised table

Water clarity criteria

• Minor text edits; revised table

Chlorophyll a criteria

Minor text edits; revised table

ADDRESSING MAGNITUDE, DURATION, FREQUENCY, SPACE AND TIME

• Significant text edits

DEVELOPING THE CUMULATIVE FREQUENCY

Significant text edits and new text

Step 1. Interpolation of water quality monitoring data

Completely new text

Step 2. Comparison of interpolated water quality data to the appropriate criterion value

Completely new text

Step 3. Identifying interpolator cells that exceed the criterion value

• Completely new text

Step 4. Calculating the cumulative probability of each spatial extent of exceedence

• Completely new text

Step 5. Plot the spatial exceedence vs. the cumulative frequency

• Completely new text

DIAGNOSING THE MAGNITUDE OF CRITERIA EXCEEDENCE

• Completely new text

DEFINING THE REFERENCE CURVE

• Completely new text

Reference curves for dissolved oxygen criteria

• Completely new text

Reference curves for water clarity criteria

• Completely new text

Reference curves for chlorophyll a criteria

• Completely new text

MONITORING TO SUPPORT THE ASSESSMENT OF CRITERIA ATTAINMENT

• Completely new text

Dissolved oxygen criteria assessment

Completely new text

Water clarity criteria assessment

• Completely new text

Chlorophyll a criteria assessment

Completely new text

EVALUATION OF CHESAPEAKE BAY WATER QUALITY MODEL OUTPUT Chesapeake Bay Watershed Model

• Completely new text

Chesapeake Bay Water Quality Model

Completely new text

Integration of Monitoring and Modeling for Criteria Assessment

• Completely new text

LITERATURE CITED

• Complete set of references

VII. RECOMMENDED CRITERIA ATTAINMENT DIAGNOSTIC PROCEDURES

• Significant text edits

ADDRESSING NATURAL EXCEEDENCE OF THE CHESAPEAKE BAY CRITERIA

Natural excursions of low dissolved oxygen conditions

• Significant text edits

Natural reductions in water clarity levels

• Significant text edits

Natural elevated chlorophyll *a* concentrations

• Significant text edits

DIAGNOSING CAUSES OF CRITERIA NON-ATTAINMENT

Dissolved oxygen criteria

• Significant text edits; new subsections added

Water clarity criteria

Minor text edits; new subsections added

Chlorophyll a criteria

• Significant text edits

LITERATURE CITED

• Complete set of references

Glossary

New addition

Acronyms

New addition

Appendices

A. Refined Designated Uses for Chesapeake Bay and Tidal Tributary Waters

• Significantly condensed set of text and figures (majority of text, tables and figures moved to the UAA Technical Support Document)

B. Sensitivity to Low Dissolved Oxygen Concentrations for Northern and Southern Atlantic Coast Populations of Selected Test Species.

New appendix

C. Summary of Literature on the Tolerance of Chesapeake Bay Macrobenthic Species to Low Dissolved Oxygen Conditions

• Only minor edits, corrections made

D. Narrative, Numerical and Method-based Chlorophyll *a* Criteria Adopted as Water Quality Standards by States Across the U.S.

New appendix

E. 1950s-1990s Chesapeake Bay and Tidal Tributary Chlorophyll *a* Concentrations by Chesapeake Bay Program Segment

• New background text added

F. Phytoplankton Reference Community Data Analyses Supporting Chlorophyll a Criteria Derivation

• Condensed version of May 2002 draft appendix

G. Data Supporting the Determination of Impairment Thresholds for Potentially Harmful Algal Bloom Species

• New appendix

H. Derivation of Cumulative Frequency Distribution Criteria Reference Curves

• New appendix

I. Analytical Approaches for Assessing Short-Duration Dissolved Oxygen Criteria

• Significant text/figure edits and additions